OPERATION & MAINTENANCE MANUAL

DFI No.: D00117
Facility Type: Water Quality Biofiltration Swale

July 2011

INDEX

1. Identification

Drainage Facility ID (DFI):	**D00117**
Facility Type:	Water Quality Biofiltration Swale
Construction Drawings:	(V-File Number) 33V-100
Location:	District: 2B (Old 2A)
	Highway No.: 47
	Mile Post: 71.33 / 71.35 (beg./end)
	Description: This facility is located on the southeast side of the Scholls Ferry/Skyline Blvd Intersection with US 26 (Hwy 047). The facility is between the eastbound lanes of US26 (Hwy047) and the eastbound onramp from SW Scholls Ferry Road.

2. Facility Contact Information

Contact the Engineer of Record, Region Technical Center, or Geo-Environmental's Senior Hydraulics Engineer for:

- Operational clarification
- Maintenance clarification
- Repair or restoration assistance

Engineering Contacts:

Region Technical Center Hydro Unit Manager

Or

Geo-Environmental Senior Hydraulics Engineer (503) 986-3365.

3. Construction

Engineer of Record:	ODOT Designer – Region 1 Tech. Center, Bruce Council, Magnolia Bartley, 503-731-8200
Facility construction:	2000
Contractor:	Mowat Construction Company

4. Storm Drain System and Facility Overview

A water quality swale is a flat-bottomed open channel designed to treat stormwater runoff from highway pavement areas. This type of facility is lined with grass. Treatment by trapping sedimentation occurs when stormwater runoff flows through the grass.

This facility is located on the southeast side of the Scholls Ferry/Skyline Blvd Intersection with US 26 (Hwy 047). The facility is between the eastbound lanes of US26 (Hwy047) and the eastbound onramp from SW Scholls Ferry Road.

The swale is an off-line facility where the water quality flow is bypassed from the primary conveyance and directed to the swale through a 12-inch storm pipe. The flow is bypassed with a high-low split flow manhole structure just west of the facility (see point A, Operational Plan, Appendix A). Water quality flows, directed toward the swale, are pretreated through a pollution control manhole for oils and floatable solids separation before actually entering the swale (see point B, Operational Plan and Photo 2).

The swale, itself, is a grass lined facility with HDPE porous pavers and topsoil lining the bottom. Enhanced treatment occurs as the stormwater flows through the swale. After traveling approximately 100 feet through the facility the stormwater is directed back into the main conveyance line via a 12-inch storm pipe.

A. Maintenance equipment access:
The facility can be accessed directly from S.W. Raab Road (Photo 1).

B. Heavy equipment access into facility:

☒ Allowed (no limitations)
☐ Allowed (with limitations)
☐ Not allowed

C. Special Features:

☐ Amended Soils
☒ Porous Pavers – HDPE Porous Pavers
☐ Liners
☐ Underdrains

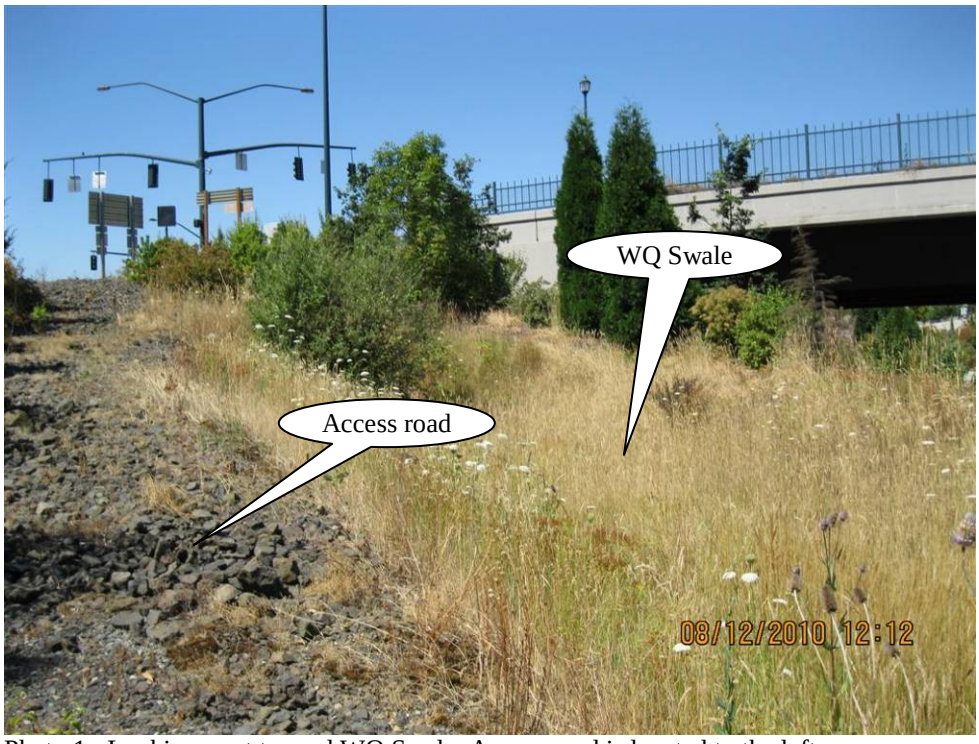


Photo 1: Looking west toward WQ Swale. Access road is located to the left.

Photo 2: Looking west at Pollution Control Manhole; see point B, Operational Plan

Photo 3: Ditch inlet serving as outlet for swale at eastern end of swale.

Photo 4: Looking west toward WQ Swale. US 26 (Hwy 047) located on the left.

Photo 5: Gravel access road from the eastbound on ramp to US26 (Hwy 047) as one departs from SW Scholls Ferry Rd.

5. Facility Haz Mat Spill Feature(s)

The water quality biofiltration swale can be used to store a volume of liquid by blocking the 12-inch diameter outlet pipe located at the outlet of the swale, using either a steel plate or sandbags. This pipe and outlet is noted as point D of the Operational Plan and also shown in Photo 3.

6. Auxiliary Outlet (High Flow Bypass)

Auxiliary Outlets are provided if the primary outlet control structure can not safely pass the projected high flows. Broad-crested spillway weirs and over flow risers are the two most common auxiliary outlets used in stormwater treatment facility design. The auxiliary outlet feature is either a part of the facility or an additional storm drain feature/structure.

The auxiliary outlet feature for this facility is:

☐ Designed into facility

☒ Other, as noted: This facility is an offline facility where only the water quality flow is directed into the swale.

7. Maintenance Requirements

Routine maintenance table for non-proprietary stormwater treatment and storage/detention facilities have been incorporated into ODOT's Maintenance Guide. These tables summarize the maintenance requirements for ponds, swales, filter strips, bioslopes, and detention tanks and vaults. Special maintenance requirements in addition to the routine requirements are noted below when applicable.

The ODOT Maintenance Guide can be viewed at the following website:

http://www.oregon.gov/ODOT/HWY/OOM/MGuide.shtml

Maintenance requirements for proprietary structures, such as underground water quality manholes and/or vaults with filter media are noted in Appendix C when applicable.

The following stormwater facility maintenance table (See ODOT Maintenance Guide) should be used to maintain the facility outlined in this Operation and Maintenance Manual or follow the Maintenance requirements outlined in Appendix C when proprietary structure is selected below:

- ☒ Table 1 (general maintenance)
- ☐ Table 2 (stormwater ponds)
- ☒ Table 3 (water quality biofiltration swales)
- ☐ Table 4 (water quality filter strips)
- ☐ Table 5 (water quality bioslopes)
- ☐ Table 6 (detention tank)
- ☐ Table 7 (detention vault)
- ☐ Appendix C (proprietary structure)
- ☐ Special Maintenance requirements:

Note: Special maintenance Requirements Require Concurrence from ODOT SR Hydraulics Engineer.

8. Waste Material Handling

Material removed from the facility is defined as waste by DEQ. Refer to the roadwaste section of the ODOT Maintenance Yard Environmental Management System (EMS) Policy and Procedures Manual for disposal options: http://egov.oregon.gov/ODOT/HWY/OOM/EMS.shtml

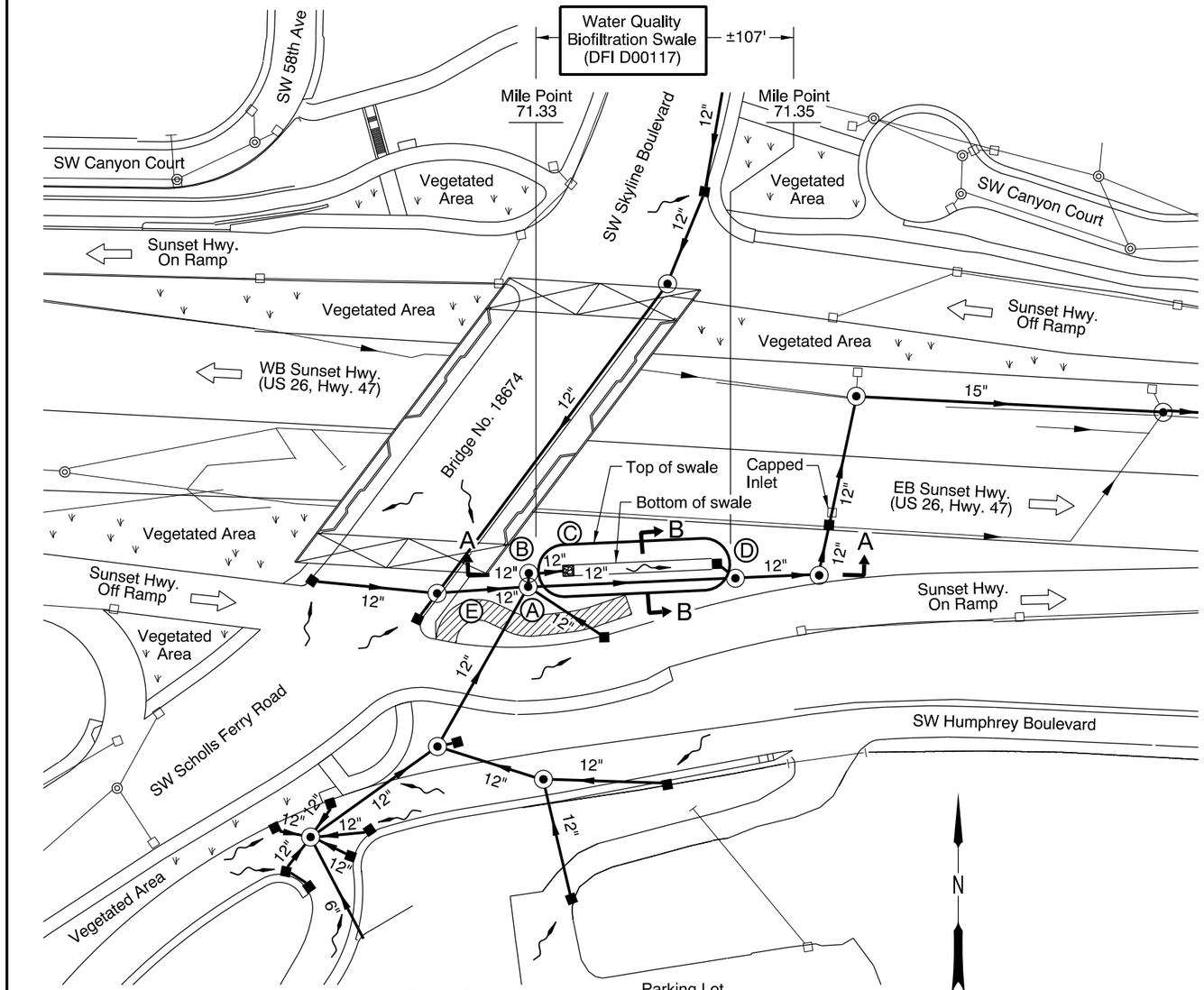
Contact any of the following for more detailed information about management of waste materials found on site:

ODOT Clean Water Unit	(503) 986-3008
ODOT Statewide Hazmat Coordinator	(503) 229-5129
ODOT Region Hazmat Coordinator	(503) 731-8304
ODEQ Northwest Region Office	(503) 229-5263

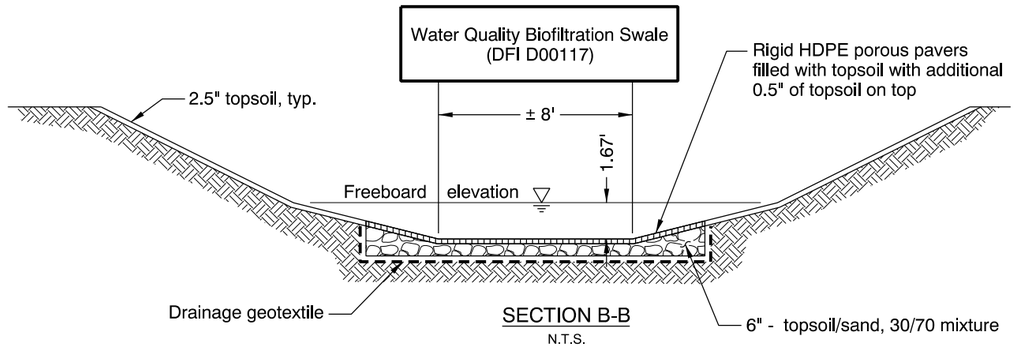
Appendix A

Content:

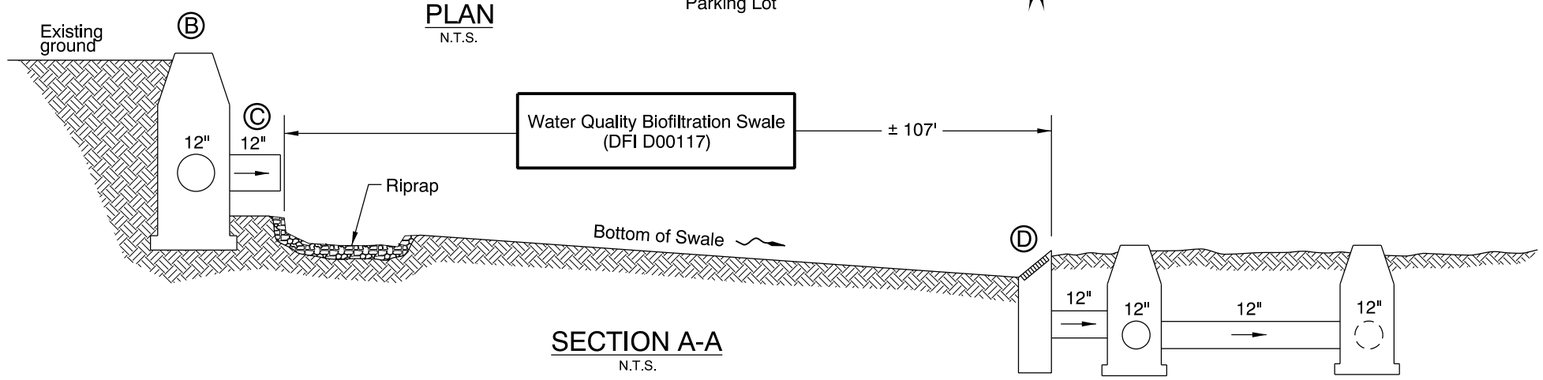
- **Operational Plan and Profile Drawing(s)**



PLAN
N.T.S.



SECTION B-B
N.T.S.



SECTION A-A
N.T.S.

LEGEND:

- Photo Location / Direction
- Ⓐ Split Flow Manhole
- Ⓑ Pollution Control Manhole
- Ⓒ Pipe Outfall at Swale Inlet with Flow Spreader
- Ⓓ Inlet Culvert at Swale Outlet
- Ⓔ Access Road
- Manhole
- Inlet
- Traffic Flow/Direction
- Storm Pipe (Facility)
- Storm Pipe
- Conveyance Direction
- Pavement / Facility Flow Path
- Concrete Barrier
- Guardrail
- Maintenance Access

Sht. 1 of 2

OREGON DEPARTMENT OF TRANSPORTATION

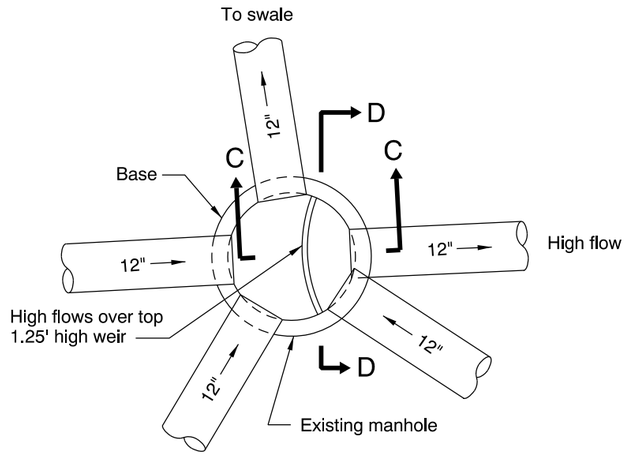
Prepared By: Wynee Hu

Drafted By: H. Gonsior/HDR

DFI D00117
MAINTENANCE DISTRICT 2B HWY 47
WATER QUALITY BIOFILTRATION SWALE
SUNSET HIGHWAY MP 71.33-71.35
MULTNOMAH COUNTY

Z:\Hydraulics\Hydraulics OM\Completed_Facility_Files\Dist_2B\Hwy_047\2B_047_D00117\Operational Plan\DFI_D00117.dgn :: Sheet 1/15/2014 6:15:31 PM hwyr33e

DFI_D00117_1.dgn



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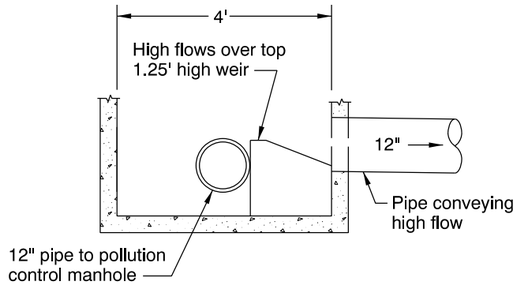
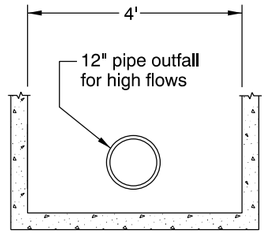


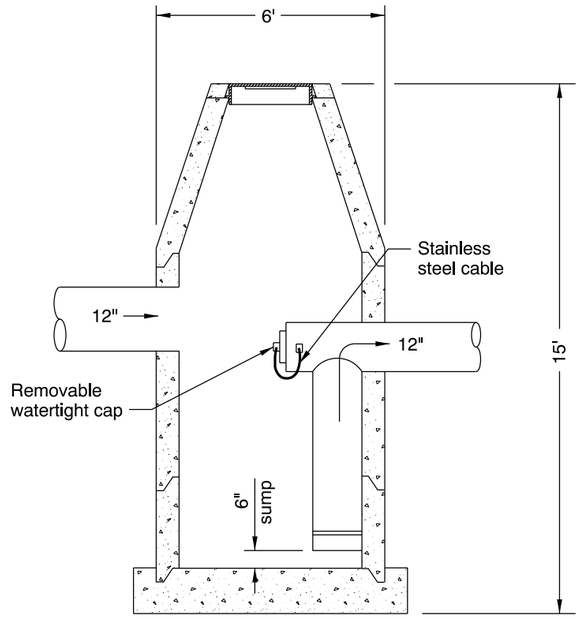
SECTION C-C



SECTION D-D

SPLIT FLOW FOR WATER QUALITY BIOFILTRATION SWALE AT POINT Ⓐ

N.T.S.



POLLUTION CONTROL MANHOLE FOR WATER QUALITY BIOFILTRATION SWALE AT POINT Ⓑ

N.T.S.

Sht. 2 of 2

OREGON DEPARTMENT OF TRANSPORTATION

Prepared By: Wynee Hu

Drafted By: H. Gonsior/HDR

DFI D00117
MAINTENANCE DISTRICT 2B HWY 47
WATER QUALITY BIOFILTRATION SWALE
SUNSET HIGHWAY MP 71.33-71.35
MULTNOMAH COUNTY

Appendix B

Content:

- **ODOT Project Plan Sheets**
  - ***Cover/Title Sheet***
  - ***Water Quality/Detention Plan Sheets***
  - ***Other Details***

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	Title Sheet
1A	Index Of Sheets
1A-2	Index Of Sheets Cont'd.
1A-3	Standard Drawing Nos.
2, 2A Thru 2A-18 Incl.	Typical Sections
2B Thru 2B-11 Incl.	Details
2C Thru 2C-8 Incl.	Traffic Control Plans
2CA-1 Thru 2CA-27 Incl.	Traffic Control Plans - Pointer Road Work Area
2CB-1 Thru 2CB-22 Incl.	Traffic Control Plans - South Side Work Area
2CC-1 Thru 2CC-61 Incl.	Traffic Control Plans - Sylvan Work Area
2D Thru 2D-9 Incl.	Water Quality Plans
2E Thru 2E-15 Incl.	Erosion Control Plans
2F	Hazardous Material Remediation Plans
2G Thru 2G-6 Incl.	Pipe Data
3	Alignment & All Construction
4	Alignment
4A	Right Of Way
4B, 4B-2	General Construction Plans
4C, 4C-2	Drainage Plans
4D, 4E	Profiles
5	Alignment
5A	Right Of Way
5B, 5B-2	General Construction Plans
5C	Drainage Plan
5D, 5E	Profiles
6	Alignment
6A	Right Of Way
6B, 6B-2	General Construction Plans
6C	Detour Plan
6D, 6D-2	Drainage Plans
6E, 6F, 6G, 6H, 6J	Profiles
7	Alignment
7A	Right Of Way
7B, 7B-2	General Construction Plans
7C	Detour Plan
7D, 7D-2	Drainage Plans
7E, 7F, 7G, 7H	Profiles
8	Alignment
8A	Right Of Way
8B, 8B-2	General Construction Plans
8C, 8C-2	Drainage Plans
8D, 8E, 8F	Profiles
9	Alignment
9A	Right Of Way
9B, 9B-2	General Construction Plans
9C	Detour Plan
9D, 9D-2	Drainage Plans

STATE OF OREGON

DEPARTMENT OF TRANSPORTATION

PLANS FOR PROPOSED PROJECT

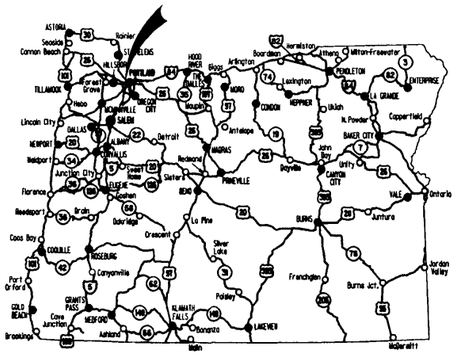
GRADING, STRUCTURES, PAVING, SIGNING, ILLUMINATION, SIGNALS, ROADSIDE DEVELOPMENT & UTILITY RELOCATIONS

CAMELOT INTCHGE. - SYLVAN INTCHGE. (PHASE 2) SEC.

SUNSET HIGHWAY

MULTNOMAH & WASHINGTON COUNTIES

OCTOBER 2000

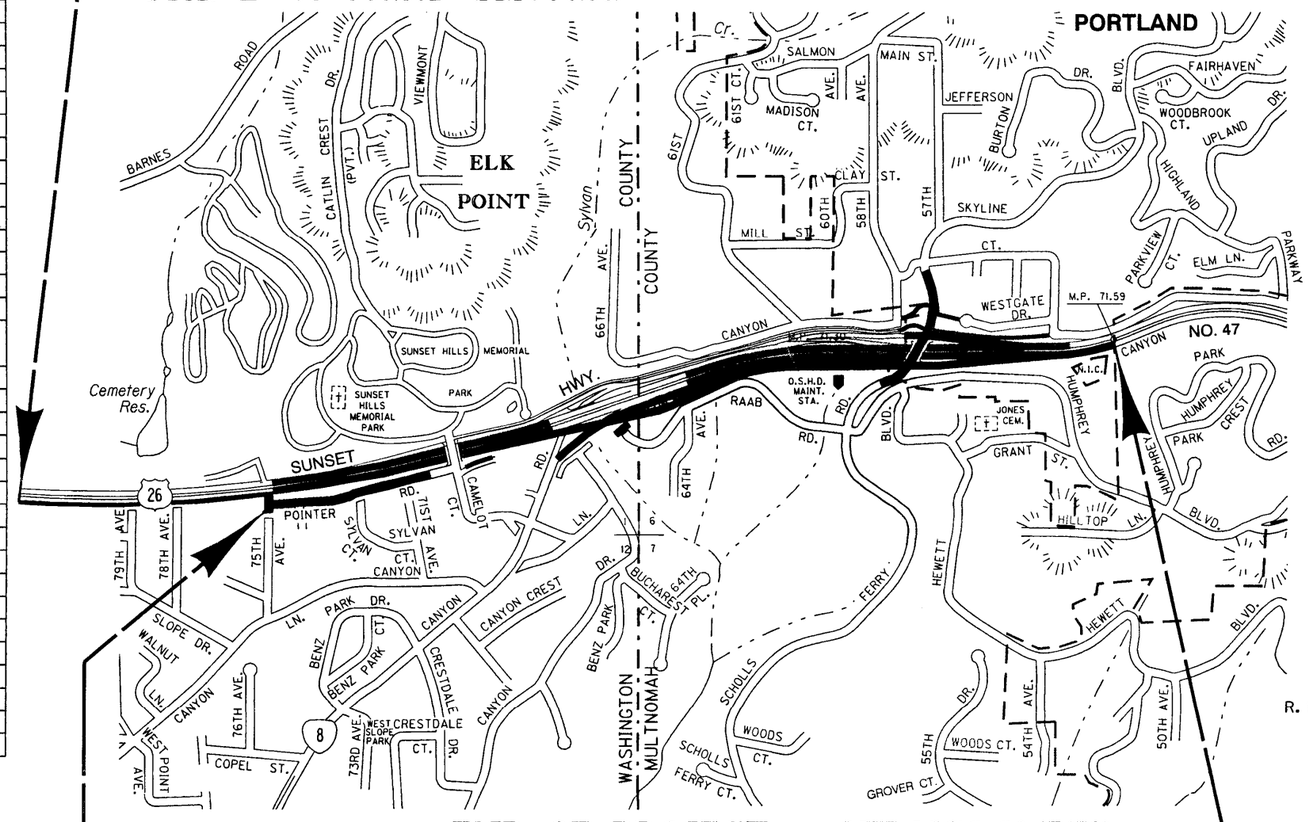


Overall Length Of Project - 2.013 km (1.25 Miles)

ATTENTION :
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0010 Through OAR 952-001-0090. You May Obtain Copies Of The Rules From The Center, Or Answers To Questions About The Rules By Calling (503) 232-1987.

LET'S ALL WORK TOGETHER TO MAKE THIS JOB SAFE

BEGIN. OF CONTRACT
STA. "L" 98+700.801 (M.P. 70.06)



T. 1 S.,
R. 1 W., 1 E., W.M.

NH-MGS-S047(32)
BEGINNING OF PROJECT
STA. "L" 99+197.000 (M.P. 70.37)

END OF PROJECT NH-MGS-S047(32)
STA. "L" 101+210 (M.P. 71.62)

METRIC

OREGON TRANSPORTATION COMMISSION

Henry H. Hewitt	CHAIRMAN
Susan Brody	VICE CHAIRMAN
Steven H. Corey	COMMISSIONER
Stuart Foster	COMMISSIONER
John Russell	COMMISSIONER
Grace Crunican	DIRECTOR OF TRANSPORTATION

REGISTERED PROFESSIONAL ENGINEER
18,458
OREGON
MAY 14, 1996
JEFFREY SCHEICK
Expires Jun. 30, 2002

Jeffrey Scheick

TECHNICAL SERVICES MANAGING ENGINEER

CAMELOT INTCHGE. - SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

FEDERAL HIGHWAY ADMINISTRATION	PROJECT NUMBER	SHEET NO.
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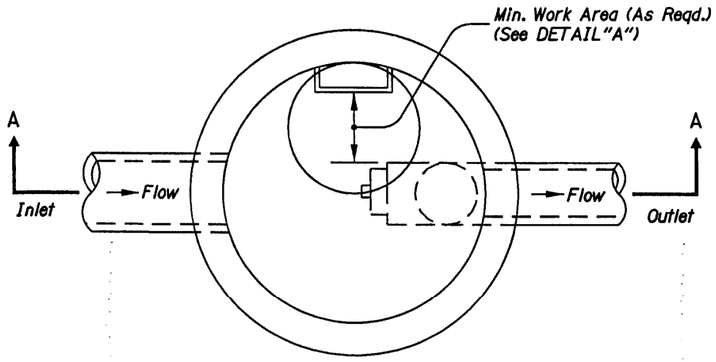
WATER QUALITY MANHOLE - VARIOUS LOCATIONS



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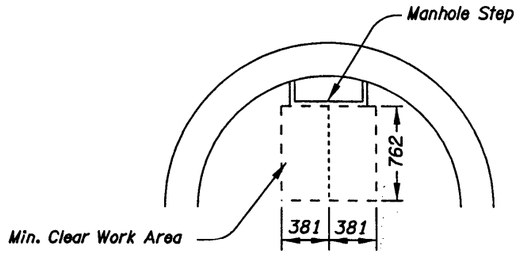
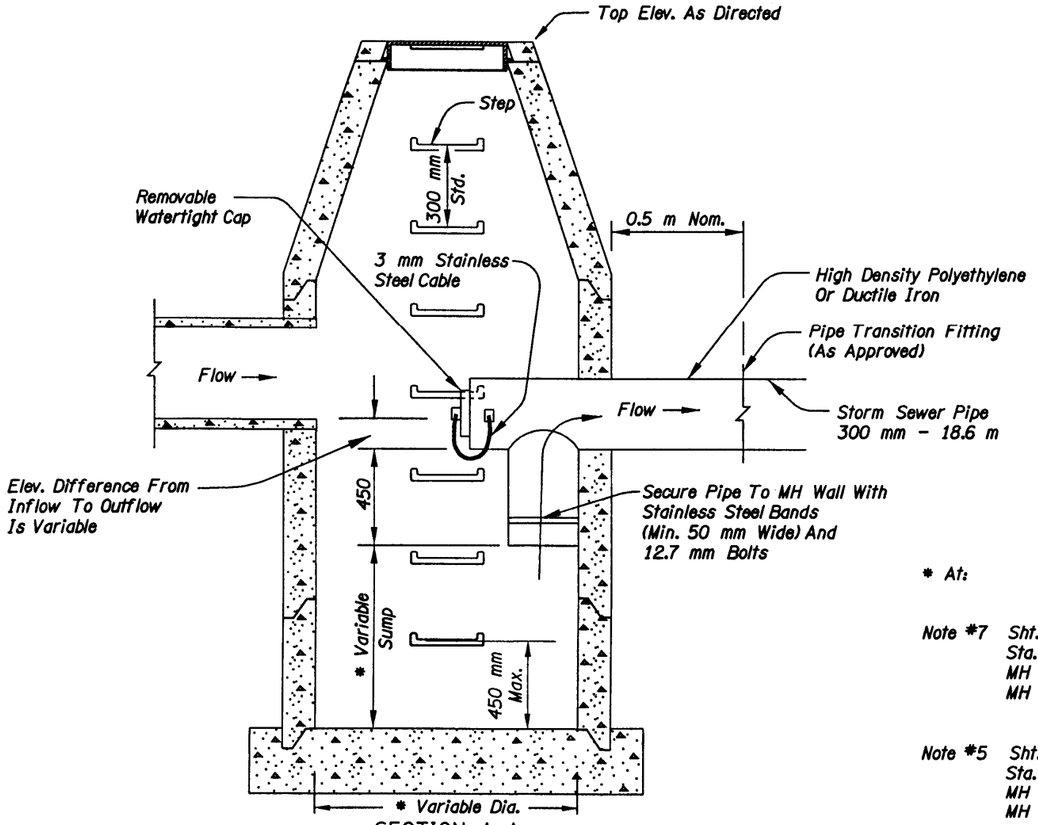


DETAIL "A"

NOTE:
Locate Pipes, Etc. So That No Portion Of Them Are Within Min. Clear Work Area.



SECTION A-A
(For Details Not Shown, See RD324, RD327 & RD330)

SUMP VOLUME REQUIREMENTS

Single Family Residential	.245 m^3/hectare
Multi Family Residential	1.539 m^3/hectare
Commercial/Industrial	6.577 m^3/hectare

* At:

Note #7 Sht. 7D-2
Sta. "SES" 100+064.5 m Rt.
MH Sump = 900 mm
MH Dia. = 1800 mm

Note #5 Sht. 8C-2
Sta. "SES" 100+436.4.9 m Rt.
MH Sump = 900 mm
MH Dia. = 1500 mm

Note #9 Sht. 9D-2
Sta. "SEE" 100+704.2, 18.83 Lt.
MH Sump = 1800 mm
MH Dia. = 1800 mm

NOTES:

1. Hardware, Fasteners And Anchors To Be Stainless Steel; Use 3 mm Stainless Steel Cable
2. See Pipe Data Sheet And Plan Sheets For Pipe Size(s).
3. See Pipe Data Sheet And Plan Sheets For Manhole Size(s).
4. See Pipe Data Sheet And Plan Sheets For Sump Depth.
5. Manhole And Base Per Manhole Standard Drawings.
6. Hardware, Fasteners, Anchors, Fittings, Appurtenances, Labor And Equipment Is Incidental To Water Quality Manhole Item.

All Dimensions Are Shown In Millimeters (mm) Unless Otherwise Noted.

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Design Team Leader - David Joe Polly
Designed By - Magnolia M. Bartley
Drafted By - Larry D. Garrison & Sandra Gish

DETAILS

SHEET NO. 2B-7

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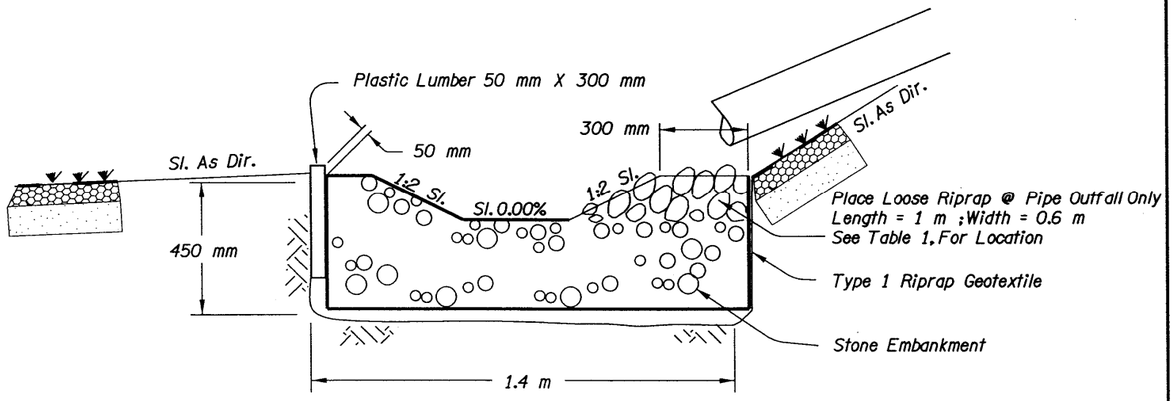
VIEW 3

VIEW 3



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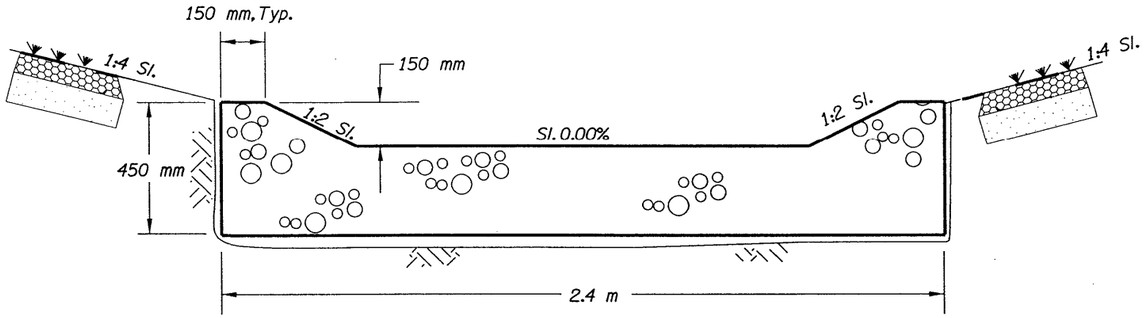
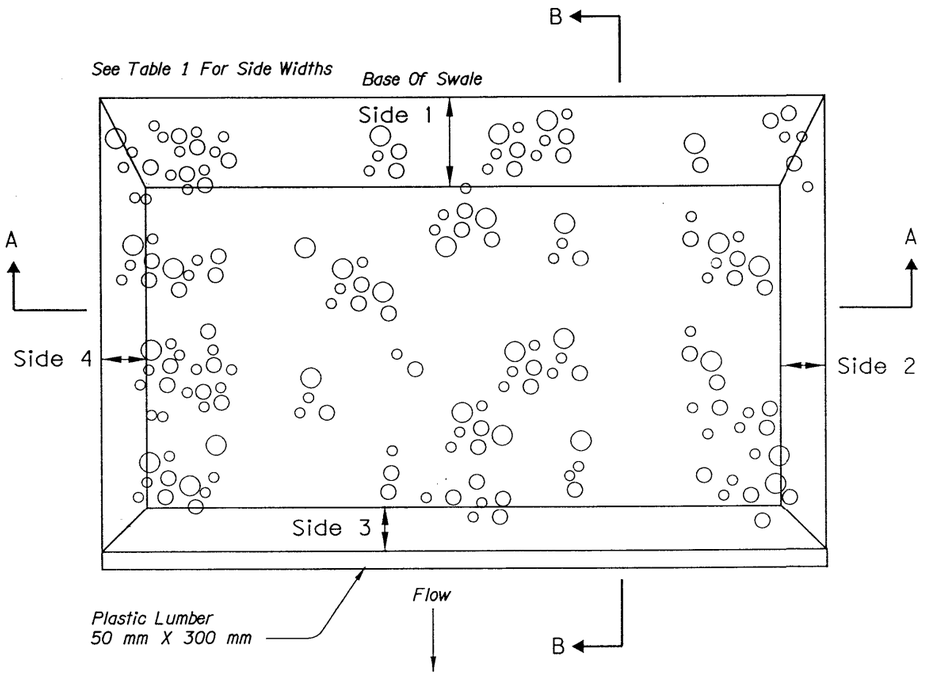


SECTION A-A

Table 1

	Side Widths (mm)				
Swale	1	2	3	4	Pipe Outfall Side
SW1	150	300	150	150	2
SW2	300	150	150	150	1
TSW	300	150	150	150	1



PLAN

W = Width of Swale Bottom*

SWALE FLOW SPREADER

No.	REVISION	DATE	BY
1	*Added The Word "Swale"*	*10-04-00*	*BSC*

All Dimensions Shown Are In mm (Millimeters) Unless Otherwise Noted

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Reviewed By - Bruce S. Council
Designed By - Magnolia Bartley
Drafted By - Magnolia Bartley

WATER QUALITY DETAILS

SHEET NO. 2D-3

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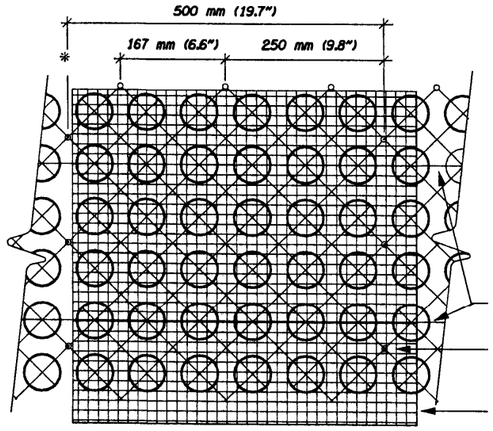
VIEW 3
VIEW



Strength - 402 kg/cm² (5720 psi)
Color - Black (Standard)
Resin - 95% Post-Consumer Recycled HDPE/LDPE

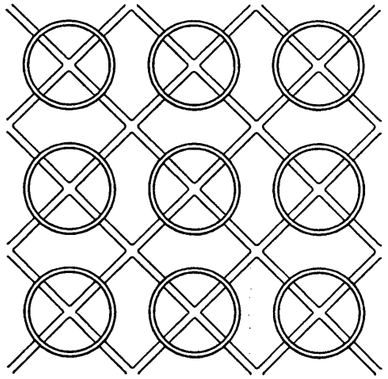
Fabric
Weight - 76.3 gm/m² (2.25 oz./S.Y.)
Tensile - 585 kg/m² (65 x 40 lb./ft.)

Rigid HDPE Porous Pavement System Cross-Bracing

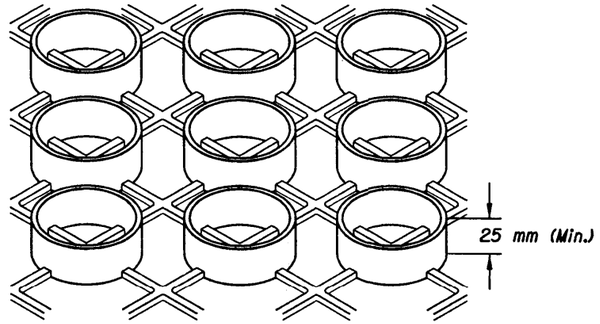
Rigid HDPE Porous Pavement System Units

Rigid HDPE Porous Pavement Fabric

PLAN

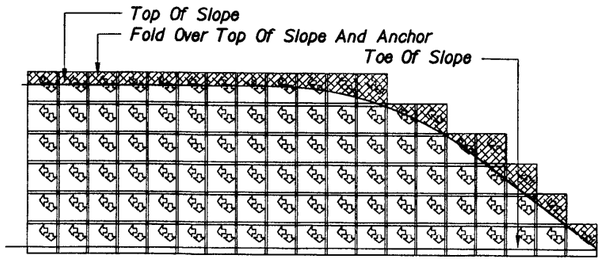


TOP VIEW

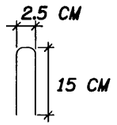


ISOMETRIC VIEW

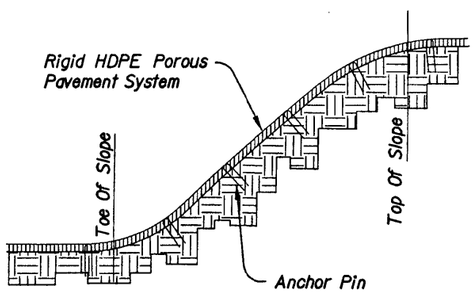
RIGID HDPE POROUS PAVEMENT SYSTEM



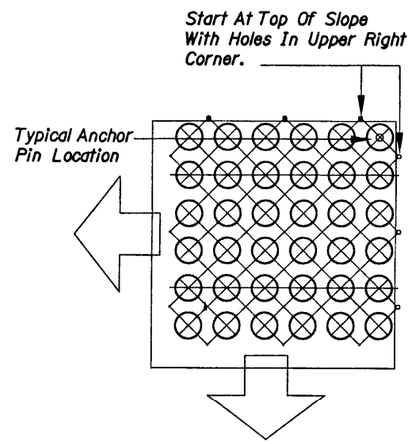
FACE OF SLOPE



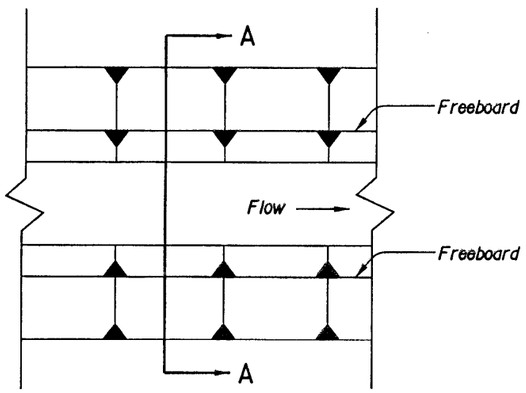
TYPICAL ANCHOR PIN



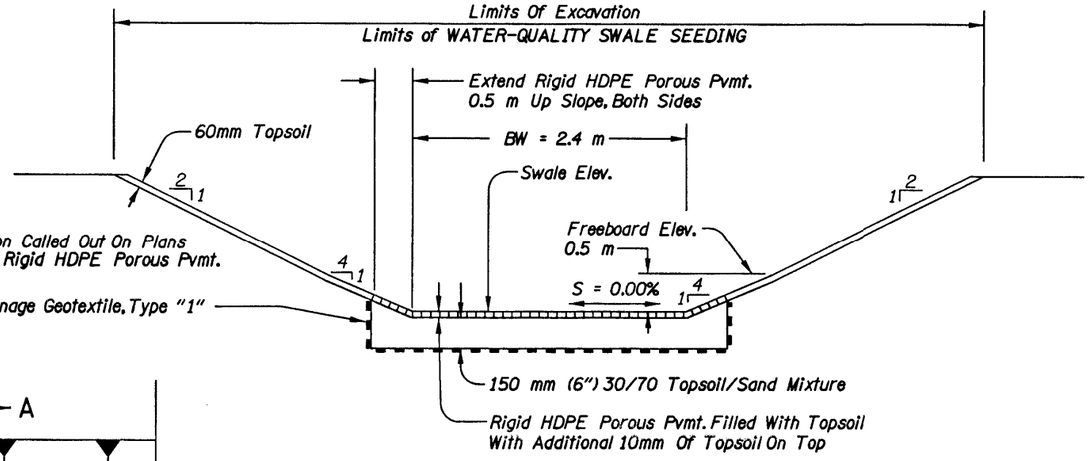
SLOPE CROSS SECTION



TYPICAL RIGID HDPE POROUS PAVEMENT SYSTEM AND ANCHORAGE



PLAN
GENERAL SWALE LAYOUT



SECTION A-A
SWALE SOIL STRUCTURE

REGISTERED PROFESSIONAL ENGINEER
19156
Bruce S. Council
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Reviewed By - Bruce S. Council
Designed By - Magnolia Bartley
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. 2D-4

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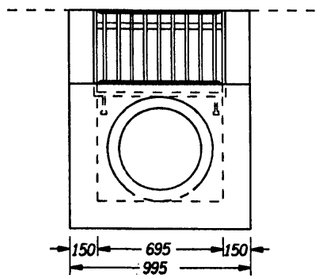
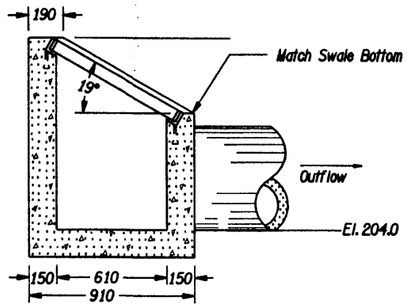
VIEW 4

VIEW 4



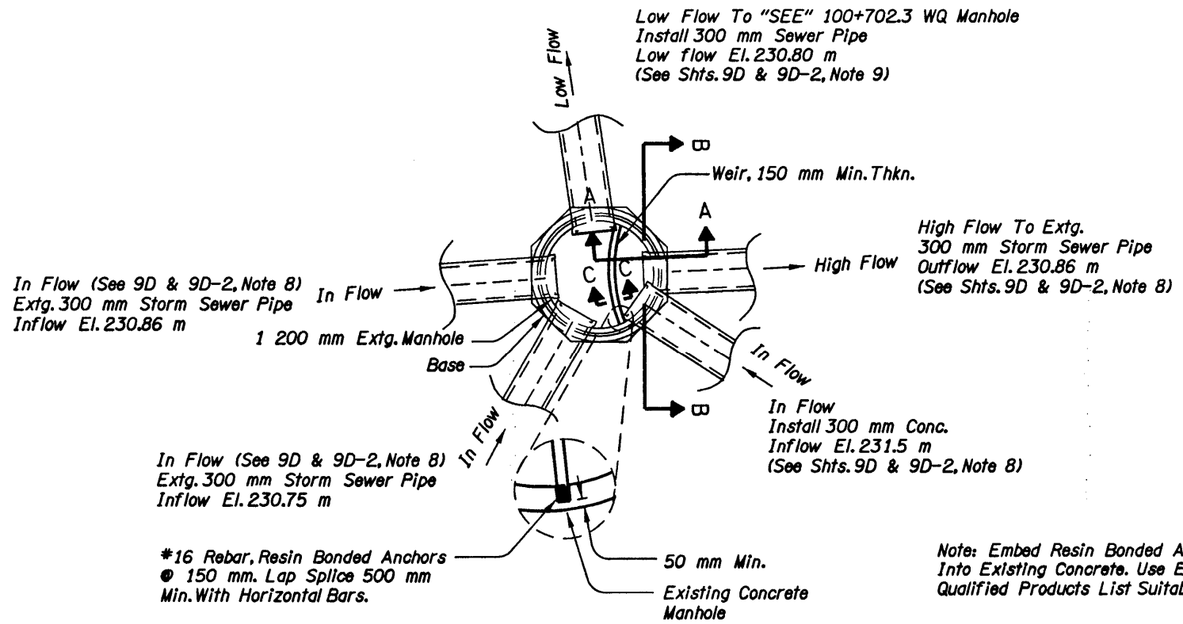
ELEVATION E-E



SECTION F-F

PLAN

TYPE D-MODIFIED

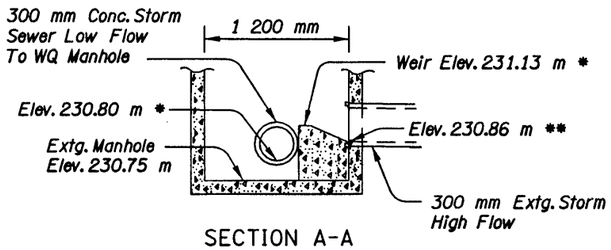


PLAN

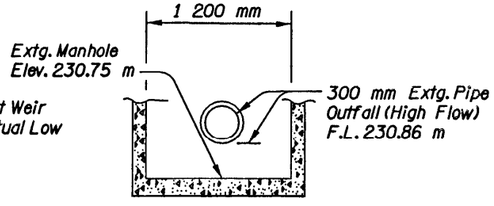
Note: Embed Resin Bonded Anchors 250 mm Min. Into Existing Concrete. Use Epoxy System From ODOT's Qualified Products List Suitable For Wet Locations.

SPLIT FLOW MANHOLE @ "SEE" 100+702.3

(For Details Not Shown, See Drg. Nos. RD327 & RD330)



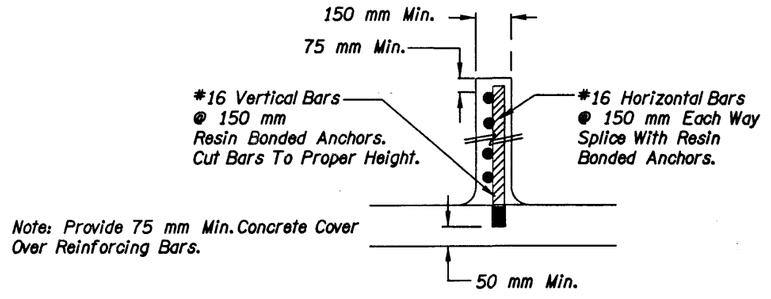
SECTION A-A



SECTION B-B

* Field Verify Elevation, Adjust Weir Height To 0.33 m Above Actual Low Flow Pipe F.L. Elevation

** Outfall (High Flow)
300 mm Extg. Storm Sew.
Outflow El. 230.86 m



SECTION C-C
WEIR DETAILS

All Dimensions Shown Are In Meters Unless Otherwise Noted

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Reviewed By - Bruce S. Council
Designed By - Magnolia Bartley
Drafted By - Martin G. Casillas

WATER QUALITY DETAILS

SHEET NO. 2D-5

28-JUL-2000 16:18
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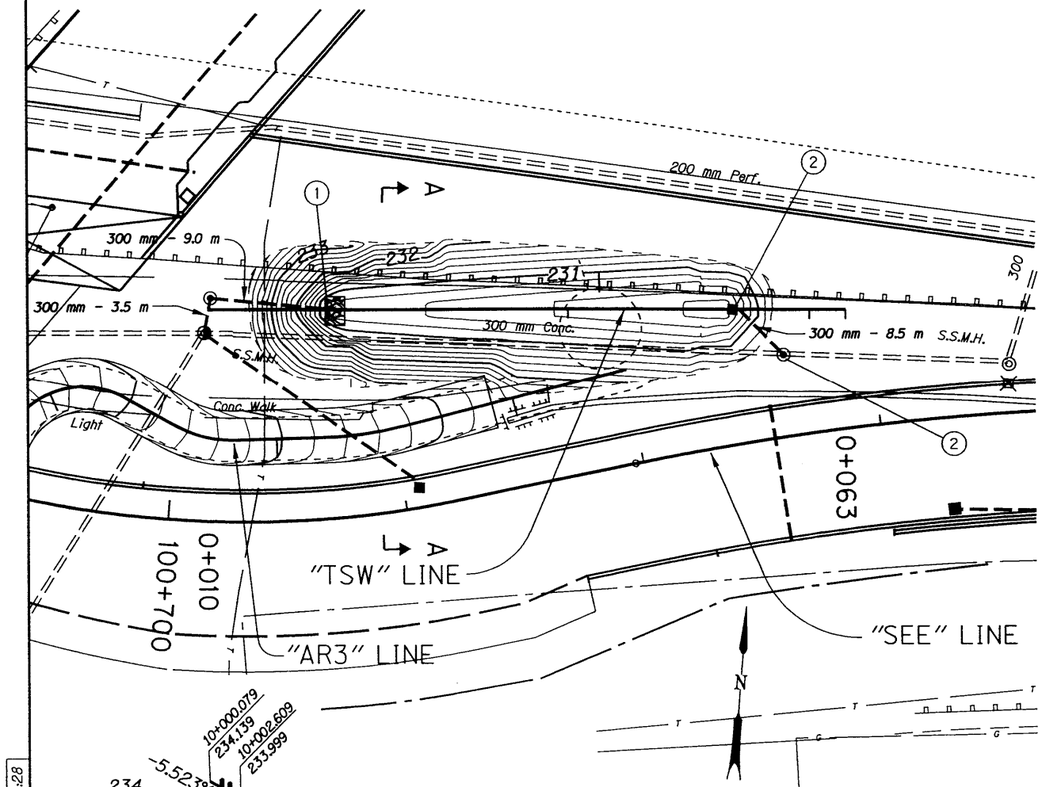
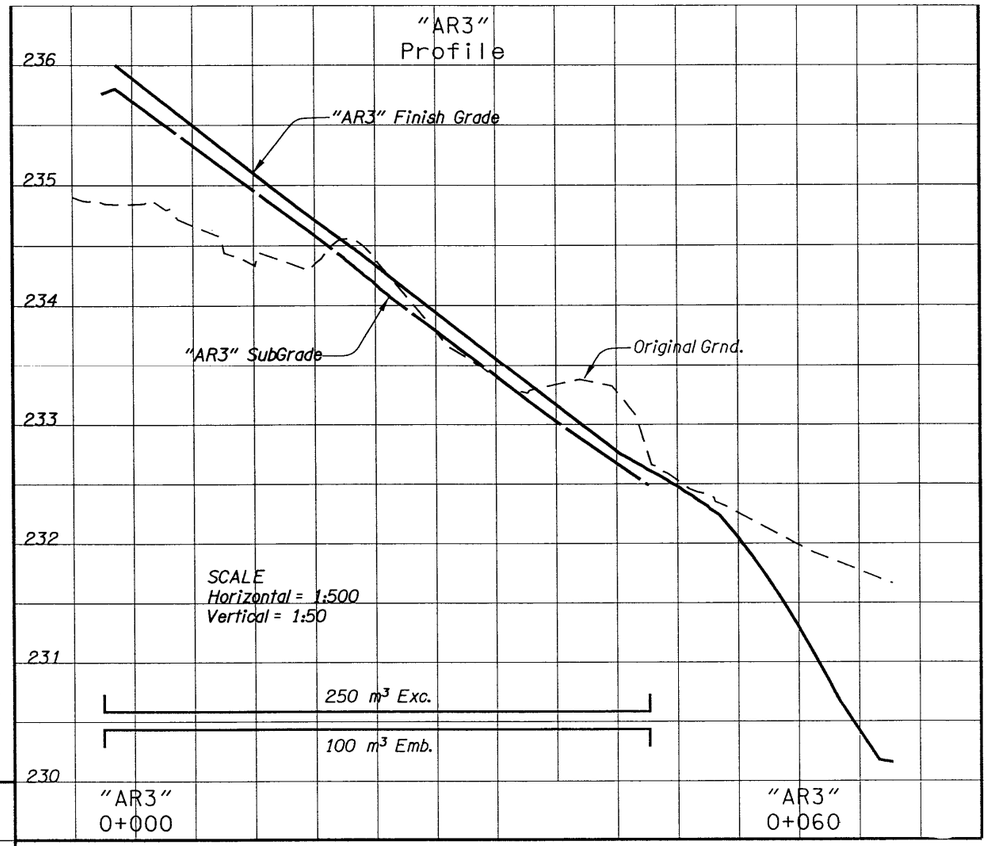
VIEW 5

VIEW 5

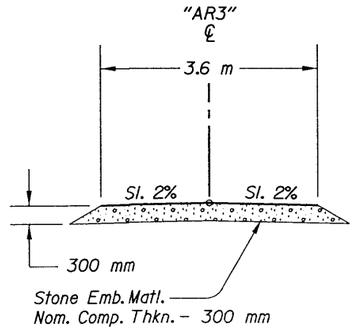
Sec. 6, T. 1 S., R. 1 E., W.M.



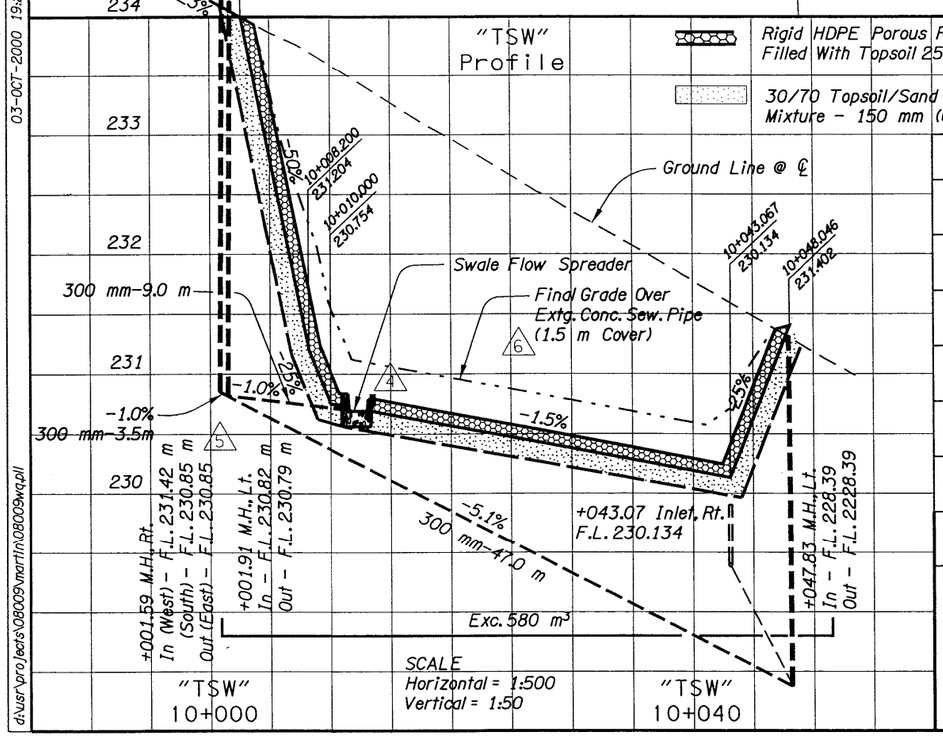


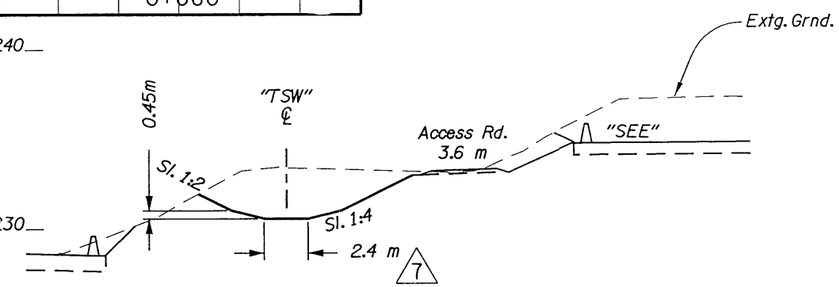
① Sta. "TSW" 0+020 △1
Const. Swale Flow Spreader,
Stone Emb. Matl. - 1.2 m³
Loose Riprap, Class 25 - 0.1 m³
Const. Water Quality Swale, "TSW" △2
Inst. Rigid HDPE Porous Pvmt. System - 258 m²
Exc. 580 m³
Const. Access Rd.
Exc. 250 m³
Emb. 100 m³
Riprap Geotextile, Type 1 - 4 m²
(For Details, See Shts. 2D-3 & 2D-4)

② Sta. "TSW" 0+053
Const. Mod. Inlet Type "D"
See Shts. 9D & 9D-2, Note 9a



Typical Section For "AR3"





"TSW" 0+030
Section A-A

No.	REVISION	DATE	BY
△1	Changed "Flow Spreader" To "Swale Flow Spreader"	10-04-00	BSC
△2	Changed "Cellular Confinement System" To "Rigid HDPE Porous Pvmt. System"	10-04-00	BSC
△3	Changed "Cellular Confinement System" To "Rigid HDPE Porous Pvmt. System"	10-04-00	BSC
△4	Added Flow Spreader Element & Text, & Symbology To Match Other Swales	10-04-00	BSC
△5	Added MH Symbol, Pipe, Flow Line Elevations & Stationing	10-04-00	BSC
△6	Added Flow Line Elevations & Stationing	10-04-00	BSC
△7	Changed Swale Bottom Dimension From 1.2 m To 2.4 m	10-04-00	BSC

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Reviewed By - Henry M. Allen
Designed By - Bruce S. Council
Drafted By - Martin G. Casillas

WATER QUALITY PLAN

SHEET NO. 2D-9

03-OCT-2000 19:28
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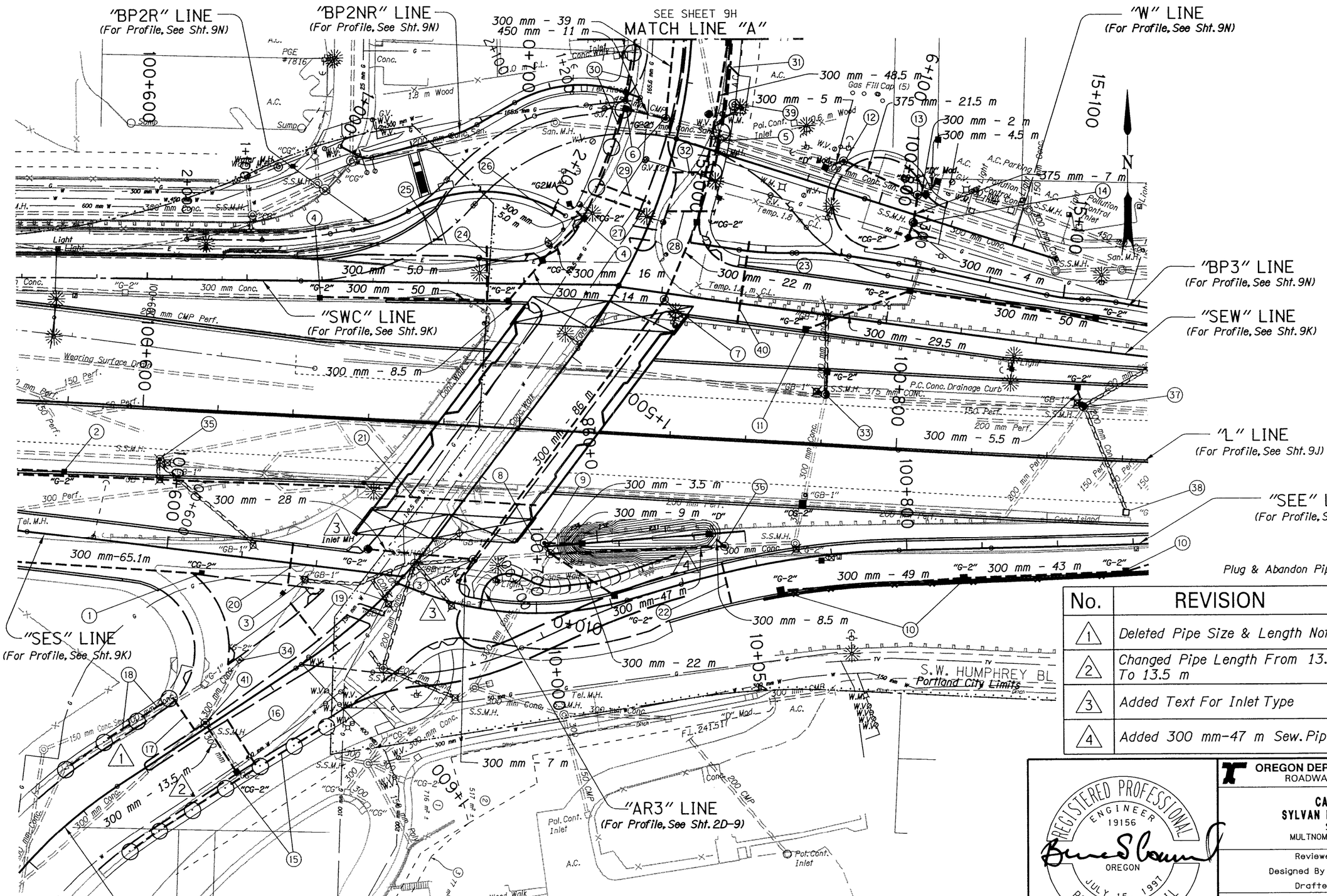
VIEW 3

Sec. 6, T. 1 S., R. 1 E., W.M.



Plug & Abandon Pipe Shown Thus:

No.	REVISION	DATE	BY
1	Deleted Pipe Size & Length Note	10-04-00	BSC
2	Changed Pipe Length From 13.3 To 13.5 m	10-04-00	BSC
3	Added Text For Inlet Type	10-04-00	BSC
4	Added 300 mm-47 m Sew. Pipe	10-04-00	BSC

NOTE: Field Verify With The Engr. All Locations Of Drainage Structures & Pipes.

REGISTERED PROFESSIONAL ENGINEER 19156 OREGON JULY 15, 1997 BRUCE S. COUNCIL Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. - SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Reviewed By - Bruce S. Council
Designed By - Magnolia Bartley - Lam Han
Drafted By - Martin G. Casillas

DRAINAGE & UTILITIES

SHEET NO. 9D

03-OCT-2000 19:32
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VIEW 6
VIEW 6

(1) See Sht. 8C-2, Note 6

(2) See Sht. 8C-2, Note 8

(3) Sta. "SYL" 1+559.3, Lt.
Remove Inlet - 4
Remove Manhole
Const. Manhole
300 mm Sewer Pipe - In Place
Remove - 1.2 m
Connect To Manhole
Const. Type "CG-2" Inlet
Const. Manhole with G-2 Inlet
Inst. 300 mm Sew. Pipe - 121 m
Tr. Exc. - 20 m
(See Drg. Nos. 58876 & 58877)[3] △2

(4) Sta. "SWC" 100+646, Rt.
Const. Type "CG-2" Inlet - 2
Const. Type "G-2" Inlet - 2
Conn. Extg. Pipe To Inlet
Const. Type "G2MA" Inlet
Inst. 300 mm Sew Pipe - 85 m
Tr. Exc. - 40 m^3

(5) Sta. "SYL" 1+433, Lt.
(See Sht. No. P-1)

(6) Sta. "SYL" 1+430.5, 4.0 m Rt.
450 mm Sewer Pipe - In Place
Remove - 12 m
Const. C.O.P. Manhole
Const. Type "CG-2" Inlet
Inst. 300 mm Sew. Pipe - 39 m
Inst. 450 mm Sew Pipe - 11 m
Tr. Exc. - 45 m^3

(7) Sta. "SYL" 1+475, 12.5 m Lt.
Const. Cast-in-place Manhole Typ. "B"
Const. Type "CG-2" Inlet - 2
Inst. 300 mm Sew Pipe - 70.5 m
Tr. Exc. - 35 m^3

(8) Sta. "SEE" 100+702.3, Lt.
Reconst. Manhole, Add Flow Splitter
Const. Type "G-2" Inlet
Inst. 300 mm Sew. Pipe - 22 m
Tr. Exc. - 25.0 m^3
(For Details, See Sht. 2D-5)

(9) Sta. "SEE" 100+702, Lt.
Const. Water Quality Swale, "TSW"
Const. Water Quality Manhole, 1.8 m Dia., 1.8 m Sump
Inst. 300 mm Sew Pipe - 12.5 m
(For Details, See Shts. 2B-7, 2D-3, 2D-4, 2D-5 & 2D-9)

(10) See Sht. 10C-2, Note 2

(11) See Sht. 10C-2, Note 4

(12) Sta. "W" 6+087.7, Lt.
Const. C.O.P Manhole
450 mm Sew. Pipe - In Place
Remove - 1.2 m
Conn. To Manhole
Const. Type "D" Mod, Inlet
Inst. 300 mm Sew Pipe - 5 m
Tr. Exc. - 6 m^3

(13) Sta. "W" 6+109, Lt.
Const. C.O.P Manhole
Const. Type "D" Mod, Inlet
Const. Type "CG-2" Inlet
Inst. 300 mm Sew. Pipe - 6.5 m
Inst. 375 mm Sew. Pipe - 21.5 m
Tr. Exc. - 25 m^3

(14) Sta. "W" 6+110.17, Rt.
Reconst. Manhole
Const. Type "CG-2" Inlet
Inst. 300 mm Sew. Pipe - 4 m
Inst. 375 mm Sew. Pipe - 7 m
Tr. Exc. - 8 m^3

(15) Sta. "SYL" 1+615.3, 17.1 m Lt. To
Sta. "SYL" 1+675.3, 16.2 m Lt.
Inst. 150 mm PVC Conduit - 59.5 m
Space Segments @ Approx. 3 m Apart
(For Layout, See Sht. R19)

(16) Sta. "SYL" 1+634.8, 8.4 m Lt.
Inst. 150 mm PVC Conduit - 14.5 m

(17) Sta. "SYL" 1+643.5, 6.5 m Rt.
Inst. 150 mm PVC Conduit - 10.5 m

(18) Sta. "SYL" 1+646.4, 11.8 m Rt. To
Sta. "SYL" 1+675.6, 11.7 m Rt.
Inst. 150 mm PVC Conduit - 30.5 m
Space Segments @ Approx. 3 m Apart
(For Layout, See Sht. R19)

(19) Sta. "SYL" 1+602.4, 8.7 m Rt.
Inst. 150 mm PVC Conduit - 13 m

(20) Sta. "SES" 11+633
Inst. 150 mm PVC Conduit - 12 m

(21) Sta. "SYL" 1+547.9
Inst. 150 mm PVC Conduit - 38 m

(22) Sta. "SEE" 100+751
Inst. 150 mm PVC Conduit - 12 m

(23) Sta. "SEW" 100+761
Inst. 150 mm PVC Conduit - 22.5 m

(24) Sta. "SWC" 100+690.2
Inst. 150 mm PVC Conduit - 16 m

(25) Sta. "SWC" 100+677, 11.7 m Lt.
Inst. 150 mm PVC Conduit - 3 m

(26) Sta. "BP2R" 2+100.3
Inst. 150 mm PVC Conduit - 4.5 m

(27) Sta. "SYL" 1+456.8, 11 m Rt.
Inst. 150 mm PVC Conduit - 18 m

(28) Sta. "SYL" 1+452, 9 m Lt.
Inst. 150 mm PVC Conduit - 13 m

(29) Sta. "SYL" 1+453.5, 9.6 m Rt.
Inst. 150 mm PVC Conduit - 13.5 m

(30) Sta. "SYL" 1+346.4, 10.8 m Rt. To
"SYL" 1+452.4, 16.8 m Rt.
Inst. 150 mm PVC Conduit - 75.5 m
Space Segments @ Approx. 3 m Apart
(For Layout, See Shts. R19 & R21)

(31) Sta. "SYL" 1+347.4, 11.1 m Lt. To
"SYL" 1+439.5, 11.7 m Lt.
Inst. 150 mm PVC Conduit - 77 m
Space Segments @ Approx. 3 m Apart
(For Layout, See Shts. R19 & R21)

(32) Sta. "SYL" 1+442.4, 6.4 m Lt.
Inst. 150 mm PVC Conduit - 11 m

(33) Sta. "L" 100+780.5, Lt.
Remove Inlet
Cap Inlet
375 mm Sew. Pipe - In Place
Remove - 1.2 m
Reconst. Manhole
Const. Type "CG-2" Inlet
Inst. 300 mm Sew. Pipe - 6.5 m
Tr. Exc. - 5 m^3

(34) Adjust Inlet

(35) Adjust Manhole, Use Method "A"
Remove Extg. Inlets - 3

(36) Sta. "SEE" 100+755 Lt.
300 mm Sewer Pipe - In Place
Remove 1.2 m
Const. Manhole
Const. Type "D" Inlet
Inst. 300 mm Sew Pipe - 55.5 m △1
Tr. Exc. - 25 m^3

(37) See Sht. 10C-2, Note 7

(38) See Sht. 10C-2, Note 1

(39) Adjust Manhole, By Others

(40) Sta. "SEW" 100+740.
Inst. 150 mm PVC Conduit - 24 m

(41) Adjust Manhole, Use Method "A"
(For Details, See Sht. 2B)

No.	REVISION	DATE	BY
△1	Changed "8.5" To "55.5"	10-04-00	BSC
△2	Added "(See Crg. Nos. 58876 & 58877)"	10-04-00	BSC

REGISTERED PROFESSIONAL ENGINEER
19156
OREGON
JULY 15, 1997
BRUCE S. COUNCIL
Expires Dec. 31, 2001

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Reviewed By - Bruce S. Council
Designed By - Magnolia Bartley
Drafted By - Heather Gonsior

DRAINAGE NOTES

SHEET NO. 9D-2

03-OCT-2000 19:24
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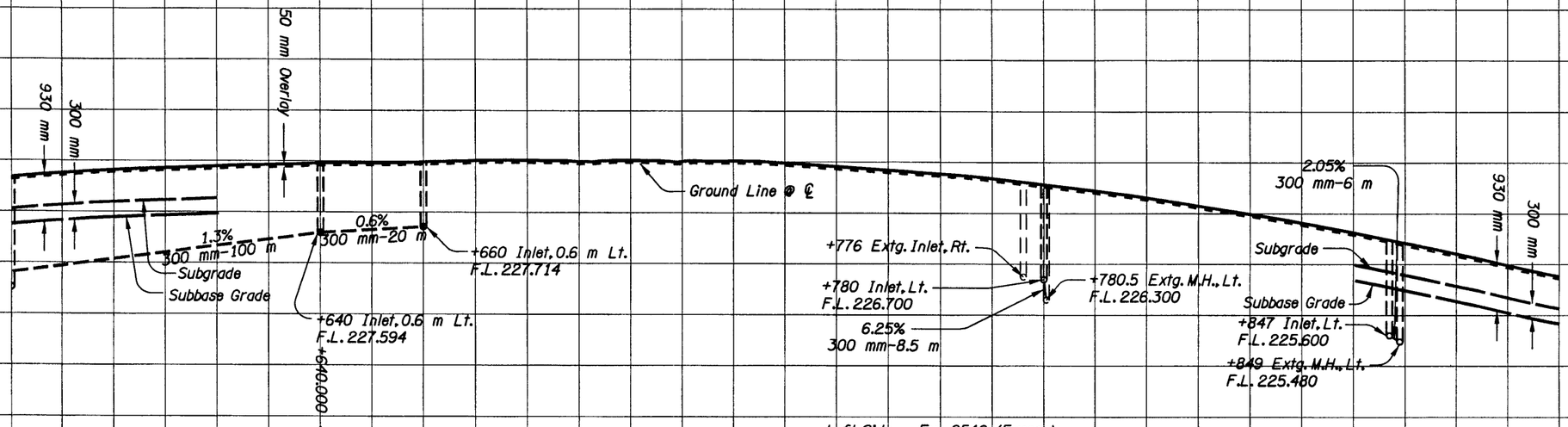
VIEW 5

"L" LINE



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VIEW 4

REGISTERED PROFESSIONAL ENGINEER
19,279
OREGON
JULY 15, 1997
DAVID JOE POLLY
Expires Dec. 31, 2000

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

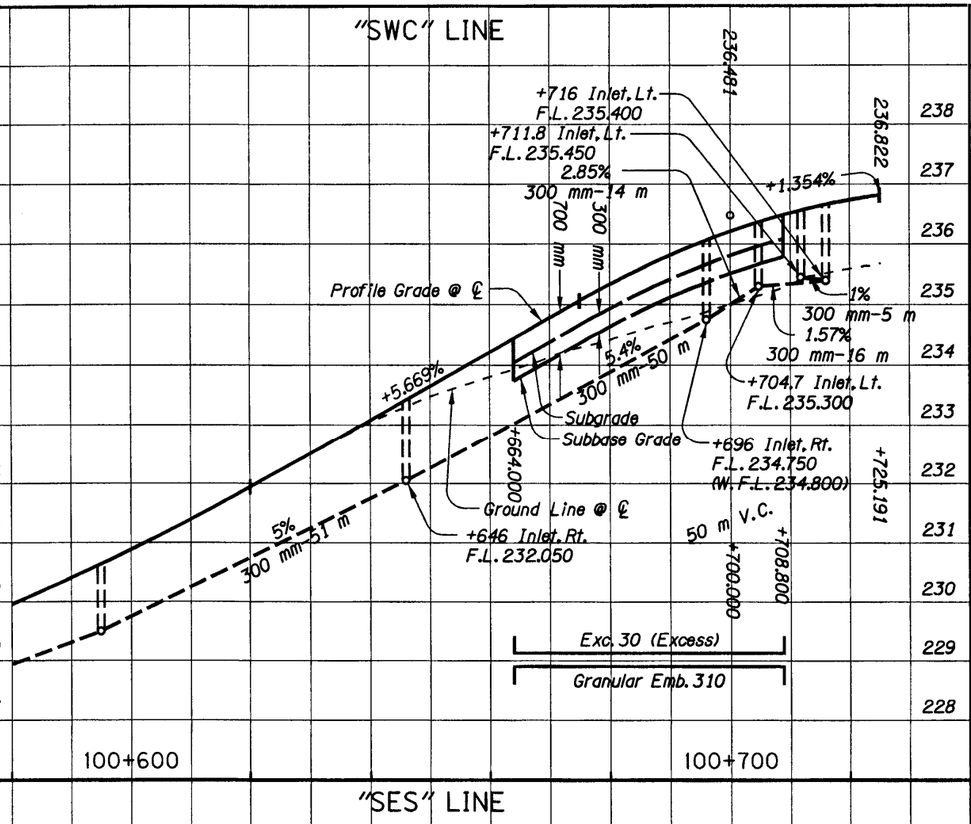
Design Team Leader - David Joe Polly
Designed By - Daniel J. McMillen
Drafted By - Sandra Gish

PROFILES

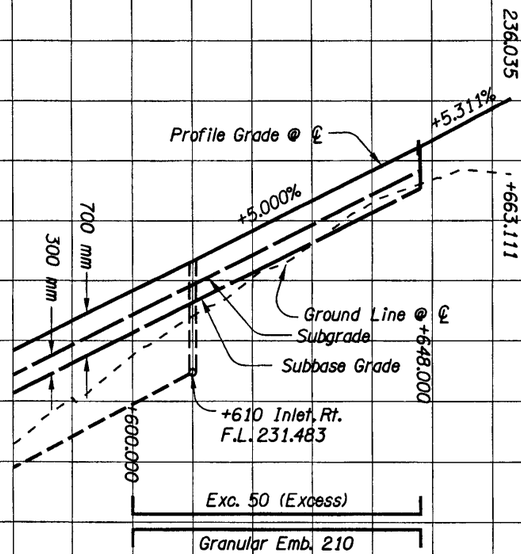
SHEET NO. 9J

VIEW 4

"SWC" LINE



"SES" LINE



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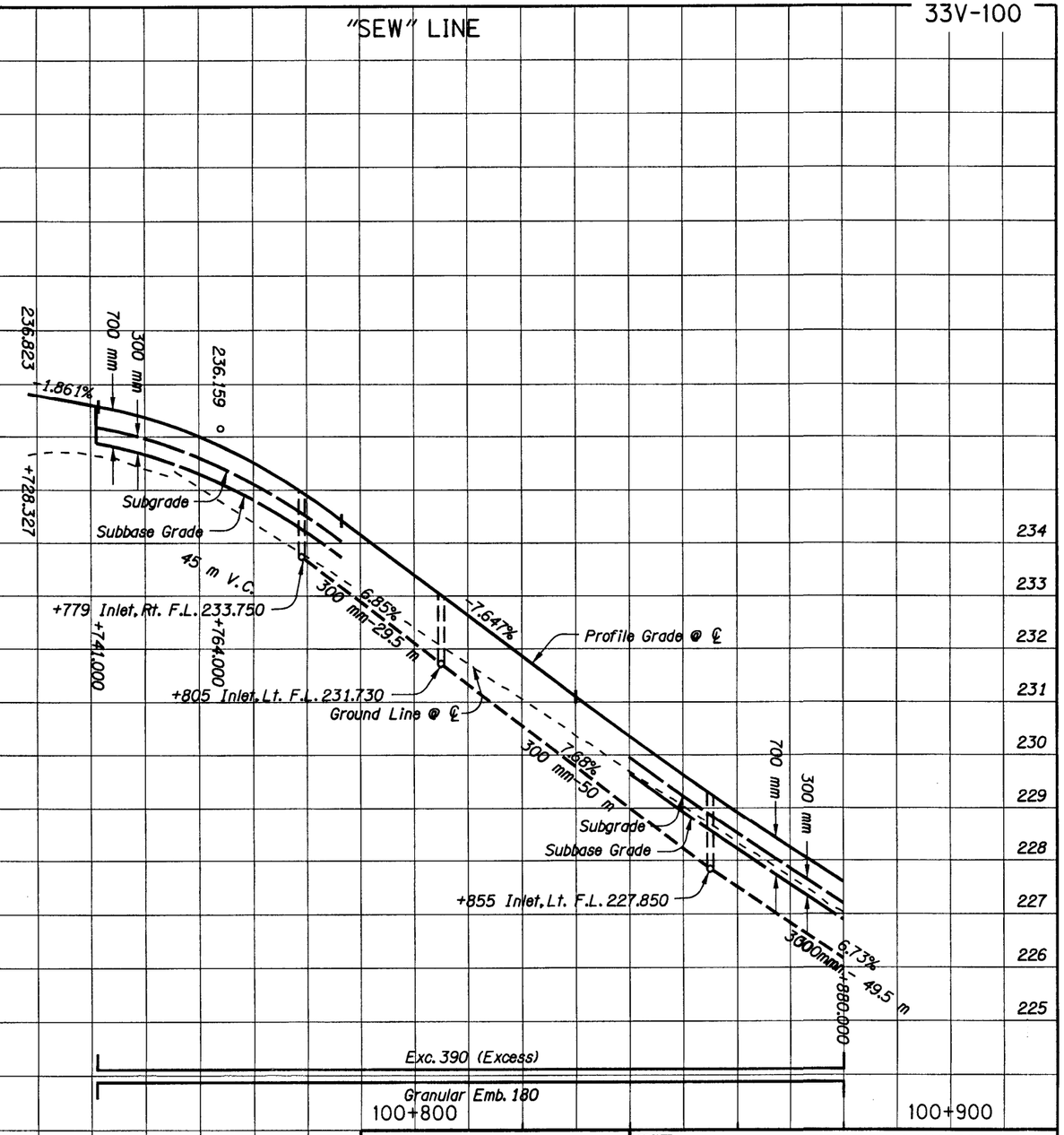

REGISTERED PROFESSIONAL ENGINEER
19,279
OREGON
JULY 15, 1997
DAVID JOE POLLY
Expires Dec. 31, 2000

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Design Team Leader - David Joe Polly
Designed By - Daniel J. McMillen
Drafted By - Sandra Gish

PROFILES

SHEET NO. 9K

24-AUG-2000 14:11
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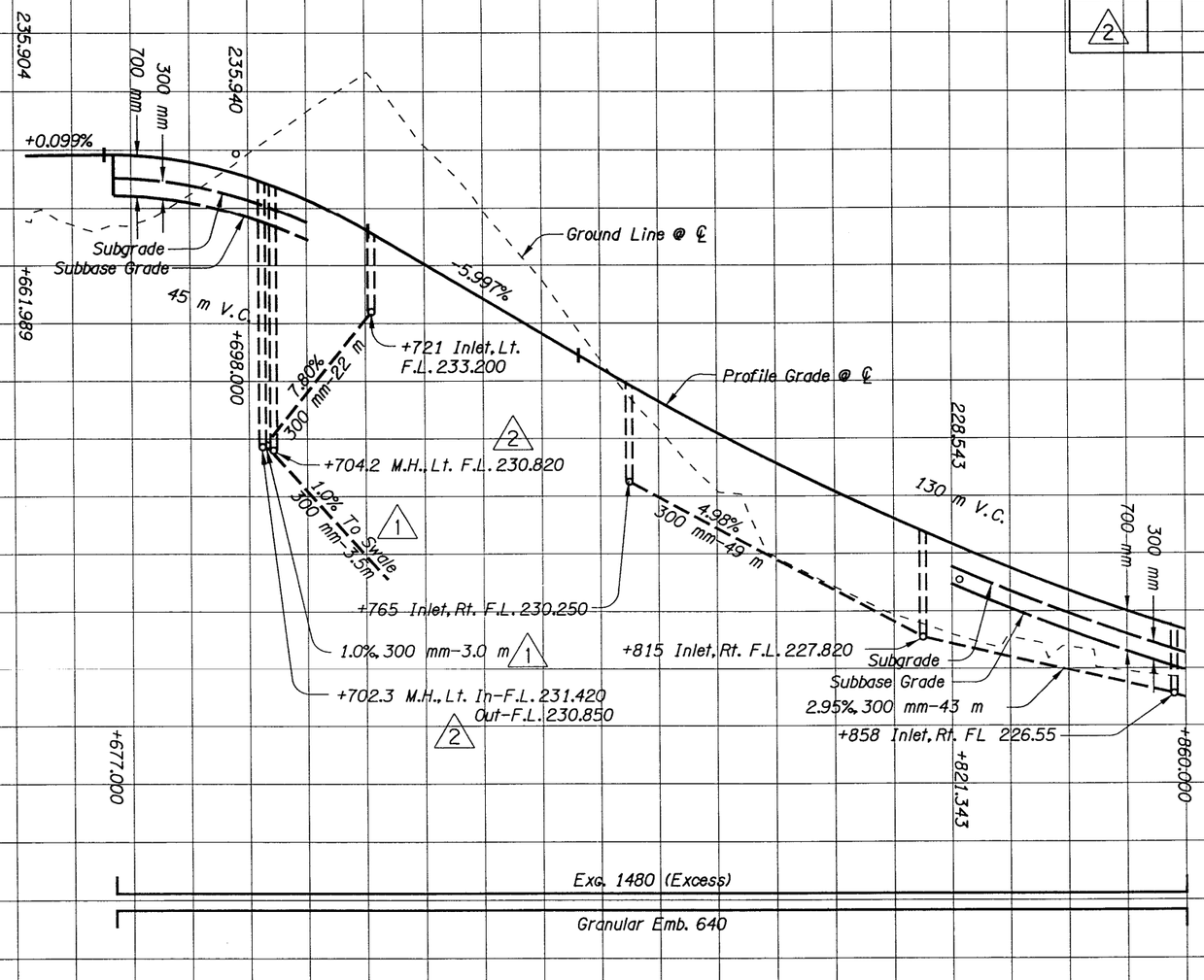
VIEW 5

VIEW 5

"SEE" LINE

No.	REVISION	DATE	BY
1	Modified Pipe Length, Slope & Added Pipe Size	10-04-00	BSC
2	Modified F.L. Elevations	10-04-00	BSC



OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Design Team Leader - David Joe Polly
Designed By - Daniel J. McMillen
Drafted By - Sandra Gish

PROFILES

SHEET NO. 9L

VIEW 6

VIEW 6

"SYL" LINE

245 244 243 242 241 240 239 238 237 236

Match Extg. Pvmt.
-5.595%
650 mm
300 mm
241.501
10 m V.C.
Sta. +362.000
Subgrade
Subbase Grade
+331.129
Ground Line @ ℄
-5.162%
Profile Grade @ ℄
+380.2 Inlet, Lt. F.L. 238.85
2.75%
300 mm-16 m
+390 Inlet, Rt. F.L. 238.630
2.47%
300 mm-9 m
+390 M.H., Rt. F.L. 238.400
+409 Inlet, Lt. F.L. 237.700
4.21%
300 mm-48.5 m
5.32%
300 mm-39.5 m
+429.9 Inlet F.L. 236.510
5.4%
450 mm-11 m
+430.5 M.H., Rt. In-flow 236.30
Outflow 235.915
Exc. 2320 (Excess)
Granular Emb. 770
Extg. CMP
Subgrade
Subbase Grade
+454 Inlet, Lt.
F.L. 235.650
+475 Inlet, Lt. F.L. 235.3500
+457.913
650 mm
236.551
300 mm
55 m V.C.
1.36%
300 mm-22 m
Bridge End Panel 1+482.089
+490.440
+1.186%
Bridge No. 18674
0.64%
300 mm-86 m
Bridge End Panel 1+560.924
237.750
85 m V.C.
2.79%, 300 mm-7 m
+565 Inlet Lt. F.L. 235.000
+559.3, Lt. MH Over Extg. Pipe F.L. 233.750
(N.E. F.L. 234.800)
+552.810
+559.000
0.89%
300 mm-28 m
+575 Inlet, Rt.
F.L. 234.000
230.226
-8.490%
650 mm
300 mm
20 m V.C.
+647.624
+687.181
Subgrade
Subbase Grade
+624.5 Inlet, Rt. F.L. 230.900
+8.34%
300 mm-21 m
+640 Inlet, Lt. F.L. 229.300
+2.63%
300 mm-13.3 m
+642 M.H. F.L. 229.00 (W.F.L. 229.2)
300 mm
+8.3%
69.2 m
-7.837%
Match Extg. Pvmt.
Exc. 2440 (Excess)
Granular Emb. 280

240 239 238 237 236 235 234 233 232 231 230 229 228 227

1+300 1+400 1+500 1+600

No.	REVISION	DATE	BY
1	Added The Word "Extg." and Switched Flow Line Elevations	10-04-00	BSC

REGISTERED PROFESSIONAL ENGINEER
19,279
OREGON
JULY 15, 1997
DAVID JOE POLLY
Expires Dec. 31, 2000

OREGON DEPARTMENT OF TRANSPORTATION
ROADWAY ENGINEERING SECTION

CAMELOT INTCHGE. -
SYLVAN INTCHGE. (PHASE 2) SEC.
SUNSET HIGHWAY
MULTNOMAH & WASHINGTON COUNTIES

Design Team Leader - David Joe Polly
Designed By - Daniel J. McMillen
Drafted By - Sandra Gish

PROFILES

SHEET NO. 9M

BRIDGE DETAILS CHECKED

03-OCT-2000 19:38

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VIEW 1

VIEW 1